Quartermaster Harbor, Page 2

- Buoy Inventory May 4, 2011
- Swing radius with boat
- Swing radius without boat. 10ft mooring line assumed.

- Eelgrass Habitat Area (DNR)
- Herring Spawning Areas (WDFW)
- Privately Owned Aquatic Parcels
- Maury Island Aquatic Reserve
- King County Parcels 2010

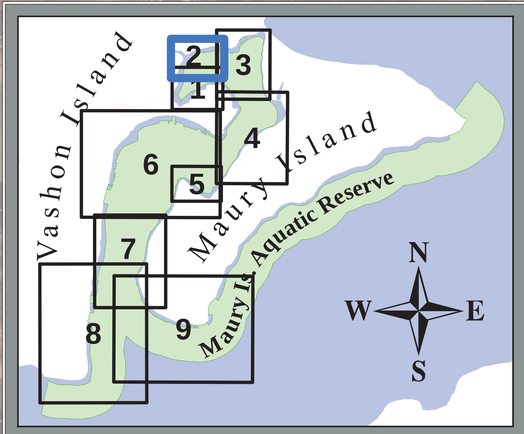
Depth Contours (NOAA), Depths in Feet, 0 = MLLW

Imagery: 2010 King County Orthophoto, 6 inch Resolution

0 500 1,000 Feet

0 100 200 300 Meters

1:1,000



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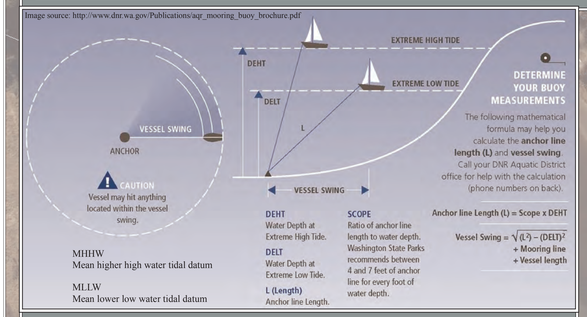
Extreme care was used during map compilation to ensure accuracy. However, due to the need to rely on outside sources for information and changes in ownership, the Department of Natural Resources cannot accept responsibility for errors or omissions of data. Therefore, no warranties accompany this data.

Map updated 9/13/2011 by DTM.

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Image source: http://www.dnr.wa.gov/Publications/aqr_mooring_buoy_brochure.pdf



Vessel Swing Radius, Scope = 4

Anchor line length and vessel swing radius calculated as follows:

Measured depths were adjusted to the MLLW and MHHW datums by adding an assumed 1foot depth-finder transducer offset and adjusting for an estimated tidal height for each buoy site.

Using tide data for Commencement Bay from the National Oceanic and Atmospheric Administration website (http://co-ops.nos.noaa.gov), the adjustment was calculated by (1) subtracting feet relative to MLLW, and (2) adding feet relative to MHHW. The differences between the mean and extreme water levels were then (1) subtracted from the MLLW and (2) added to the MHHW to find the extremes. DELT and DEHT were then used to find anchor line length and swing radius by the following formulas:

Anchor line length = SCOPE x DEHT where SCOPE is the ratio of anchor line length to water depth. Washington State Parks recommends between 4 and 7 feet of anchor line for every foot of water depth. SCOPE = 4 was used in these calculations.

Swing Radius = $\sqrt{(L^2) - (DELT^2)}$ + mooring line (10ft assumed) + vessel length

These formulas are described in the brochure:
"How to Moor Your Boat On State-Owned Aquatic Lands"

These results are based on Commencement Bay tide data and the assumptions described above. Various sources of error including tide prediction error and variation in the position of the depth sounder relative to the mooring buoy anchor are not considered here.

Maury Island Aquatic Reserve Boundry

Herring Spawning Area (WDFW)

Quartermaster Harbor

104
103
105
106